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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/666,476

09/19/2003

Sujit Sharan

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INTEL CORPORATION
c/o INTELLEVATE, LLC
P.O. BOX 52050
MINNEAPOLIS, MN 55402

EXAMINER

SMITH, NICHOLAS A

ART UNIT

PAPER NUMBER

1753

MAIL DATE

DELIVERY MODE

09/21/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/666,476	Applicant(s) SHARAN, SUJIT	
	Examiner Nicholas A. Smith	Art Unit 1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9, 10 and 16-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9, 10 and 16-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 20 September 2006 has been entered.

Status of Claims

2. Claims 9-10 and 16-28 remain for examination.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 9, 10 and 16-17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uzoh et al. (US Patent 5,807,165).

5. Regarding claim 9, Uzoh teaches an apparatus comprising:

- a polishing pad (64) mounted on a platen (62);
- a segmented cathode (64C) disposed between the platen and the polishing pad (see Figure 11C);
- a slurry disposed on said polishing pad (74);

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- a wafer (W) disposed on said polishing pad and said slurry, said wafer mounted in a wafer carrier (66);

- a power supply which applies a voltage between the polishing pad and the wafer (80, see column 5 lines 10-13; note that applying a current inherently implies applying a potential)

- a computer to vary the voltage (column 5, lines 23-33).

6. In regards to claim 9 feature "a segmented cathode disposed between said platen and a rear surface of said polishing pad," Uzoh et al. teaches a segmented cathode disposed between said platen and a rear surface of said polishing pad (col. 6, lines 11-18 and Figure 11 a).

7. In regards to claim 9 feature "said segmented anode being partitioned into small components that may be adjusted separately," Uzoh et al. discloses small components of a segmented anode (Fig. 10, multiple 67). Furthermore, each small component is capable of being adjusted separately by a spring mechanical bias (col. 5, line 66 to col. 6, line 10) and therefore meets the claim limitation.

8. In regards to claim 9 feature "a segmented anode disposed between a rear surface of said wafer and said wafer carrier," Uzoh et al. does not explicitly teach this feature.

9. However, Uzoh et al. does teach a segmented anode disposed between said wafer and said wafer carrier (Fig. 8-10), particularly between the side of the wafer and the inside portion of the wafer carrier. While Uzoh et al. does not specifically teach a segmented anode disposed between a rear surface of said wafer and said wafer carrier,

it would have been obvious to one of ordinary skill in the art at the time of invention to rearrange the location of the segmented anode to between the rear surface of the wafer and the wafer carrier in Uzoh et al.'s apparatus because the location of the anode doesn't not change the operation of the apparatus. See MPEP 2144.04 VI.

10. In regards to claim 9 feature "said polishing pad having properties that may be changed to optimize polish rate and polish selectivity for different materials, said properties comprising: hardness, stiffness, porosity, abrasiveness, and absorbance," Uzoh et al. inherently discloses a polishing pad capable of having properties that may be changed by a power supply to optimize polish rate and polish selectivity for different materials, said properties comprising: hardness, stiffness, porosity, abrasiveness, and absorbance. Since no special features are described about the instant polishing pad, Uzoh et al.'s. description of a conventional polishing pad (col. 5, line 42 to col. 6, line 25) would be inherently capable of having the claimed properties.

11. Regarding claim 10, Uzoh teaches that the wafer comprises a continuous and conductive surface layer (18, see column 1, lines 38-41).

12. Regarding claims 16, Uzoh teaches that the computer is used to control the voltage in response to an endpoint detection, i.e. thickness (Column 5, lines 23-33). The speed of removal is inherently dependent on the material type being removed since electrochemical processes are involved and different materials are disclosed as being removed (col. 1, lines 28-42).

13. Regarding claim 17, Uzoh et al. discloses varying voltage (Fig. 14).

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14. Regarding claim 19, Uzoh et al. discloses controlling via a process parameter, such as thickness (col. 5, lines 23-33).

15. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Uzoh et al. in view of Emesh et al. (US 6,572,755).

16. Uzoh et al. does not explicitly disclose a computer varying voltage as a function of temperature.

17. Emesh et al. pertains to electrochemical processing of a working surface (claims 65-66). Emesh et al. discloses an apparatus wherein the process is controlled by temperature (col. 10, lines 11-21). It would have been obvious to one of ordinary skill in the art to modify Uzoh et al.'s apparatus with Emesh et al.'s controller dependent on temperature in order to control the rate of electrochemical processing (Emesh et al., col. 10, lines 11-21).

18. Claims 20-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uzoh et al. in view of Parikh et al. (US 2003/0040830).

19. Uzoh et al. does not explicitly disclose an apparatus wherein process parameter is slurry flowrate, tool parameter is rotation speed, feedforward or feedback process control.

20. Parikh et al. pertains to monitoring and control of semiconductor surfaces (paragraphs [0019]-[0027]). Parikh et al. discloses an apparatus wherein a process parameter is slurry flowrate, tool parameter is rotation speed in a CMP process, feedforward or feedback electrochemical process control (paragraph [0035]). It would have been obvious to one of ordinary skill in the art to modify Uzoh et al.'s apparatus

with Parikh et al.'s controller in order to improve wafer processing (Parikh et al., paragraph [0035]). While Parikh et al. does not explicitly disclose rotation of either a platen or wafer carrier in a CMP process, Uzoh et al. discloses CMP rotation is in either the platen or wafer carrier (Uzoh et al., Figure 7).

21. Claims 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uzoh et al. in view of Walters et al. (US 6,767,427).

22. Uzoh et al. does not explicitly disclose proportional, differential or integral control (PID) of voltage.

23. Walters et al. pertains to CMP processing (abstract). Walters et al. discloses PID control of CMP (col. 6, lines 15-22). It would have been obvious to one of ordinary skill in the art to modify Uzoh et al.'s apparatus with Walters et al.'s PID controller in order to condition the polishing pad for CMP processing (Walters et al., col. 3, lines 2-21).

Response to Arguments

24. Applicant's arguments filed 22 August 2007 have been fully considered but they are not persuasive. In regards to Applicant's argument that the modification of the location of the segment anode is unobvious, Applicant only presents a conclusion statement (remarks, p. 7, lines 12-19, 22 August 2007) and thus does not overcome the rejection.

Conclusion

25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicholas A. Smith whose telephone number is (571)-


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272-8760. The examiner can normally be reached on 8:30 AM to 5:00 PM, Monday through Friday.

26. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy Tsang-Foster can be reached on (571)-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

27. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NAS


SUSYTSANG-FOSTER
PRIMARY EXAMINER